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(54) Meat curing

(57) Meat, especially pork, is cured by injection of saturated brine comprising xanthan gum and having salt particles suspended therein. The salt may have particle size not greater than 100 micrometers. The method facilitates injection of the meat and reduces drip-loss when the meat is stored in a sealed plastic bag.

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METHOD FOR SALTING MEAT

This invention relates to the salting (curing) of meat, especially of pork to produce bacon. As used herein, the term "bacon" is used generically to cover all pork-derived products which are sold after salting, e.g. gammon, collar, hock and slipper, as well as the various forms of bacon itself.

It is known to preserve meat by treatment with salt. For this purpose the salt must penetrate the interior of the meat and it has been customary to inject brine, i.e. salt solution, into the meat through fine nozzles. The meat so injected may then be immersed in brine to complete the process. Current food regulations require that meat which contains more than 10% of added water must be labelled to show the amount of water added. It is therefore normal practice to sell meat containing not more than 10% of added water. The shelf life of salted meat depends upon the salt content. For a shelf life of about four weeks, which is appropriate for retailers who have a rapid turnover of stock, a salt content of about 2.5 to about 2.75% is adequate, but for a shelf life longer than this, e.g. six weeks, the salt content must be increased up to 2.75% to 3.5% by weight.

Such high salt contents cannot be achieved by injection of brine into meat. However, as described in our

Application No. 87 07845, high salt concentrations can be reached by the injection of saturated brine which has suspended therein so-called "microfine salt", the salt particles being capable of passing through a sieve having apertures of 100 micrometres, and preferably capable of passing though a sieve having apertures of 50 micrometres. Such microfine salt is commercially available for incorporation into butter where the fine particle size is required to permit homogeneous mixing and prevent any sensation of grittiness in the butter. Salt of ordinary particle size cannot be used as it clogs the injection nozzles and cannot be satisfactorily injected into the meat.

After injection of the salt suspension the injected meat can be stored inside sealed plastic bags. The meat is first injected with brine containing microfine salt and the injected meat is then placed in a plastic bag which is sealed and usually heat shrunk. After the salt has had time to permeate evenly through the meat the cured meat may be removed from the bag and sliced and repackaged in the usual way. This has the advantage of greater cleanliness and avoids the use of brine baths.

When a suspension of microfine salt in brine is used for injection it is necessary, in order to ensure homogeneity of the suspension, to stir the brine continuously. Such stirring does, however, represent a

continuous input of energy and raises the temperature of the brine which should be kept at about 2 to 3°C prior to injection. Stirring can also lead to the entrainment of air bubbles and foam formation. It may be difficult, as a practical matter, to ensure complete homogeneity. If, for any reason, the injected suspension is not homogeneous there is a risk that areas of low salt concentration may be present in the injected meat with a consequential risk of localised bacterial contamination.

During storage of injected meat in plastic bags "drip-loss" occurs. Aqueous liquid is exuded from the meat resulting in weight loss and, possibly, spoiling the appearance of the meat. There may also be a risk of bacterial contamination of the exudate. Excessive drip-loss is a particular problem with whole, bone-out hams and fore-ends.

The present invention seeks to overcome the potential difficulties associated with the injection of a suspension of salt in saturated brine by the use of xanthan gum in order to stabilise the suspension and to reduce drip-loss.

According to the present invention meat, especially pork, is cured by injection of saturated brine which comprises xanthan gum and which has suspended therein salt particles which are preferably capable of passing through a sieve having apertures of 100 micrometres, and more preferably capable of passing through a sieve having

apertures of 50 micrometres. The particle size of the salt used should be such that clogging of injection nozzles does not occur.

The inclusion of xanthan gum in the suspension reduces or removes the need for continuous stirring of the salt suspension to maintain homogeneity and substantially reduces drip-loss from the injected meat.

The suspension is also stabilised and can, if necessary, be stored for several days. The danger, in the absence of xanthan gum, of recrystallisation of the microfine salt particles to produce particles of larger size is reduced so that it is not necessary to make up the suspension for injection only shortly before it is required for use.

Xanthan gum is a polysaccharide which can be obtained by culturing the bacterium Xanthomonas campestris. It is available commercially as a powder which dissolves in water to yield solutions having high viscosity at low concentrations of gum. The product sold as Satiaxane CX 91 HV (high viscosity) is particularly suitable and is generally used at a concentration of 0.2 to 45% by weight of the final brine suspension. Other xanthan gum products may require different concentrations to produce a suitable viscosity such that salt particles remain in suspension. The concentrations necessary can be determined by routine experimentation.

The saturated brine may be made up by dissolving ordinary coarse salt in water with the addition of the usual preservatives such as nitrates, nitrates and/or ascorbic acid in the usual amounts.

In preparing the salt suspension it is preferable to add to stirred brine a mixture of salt and xanthan gum. This procedure reduces the likelihood of coagulation during mixing. The mixture of salt and xanthan gum constitutes a feature of the present invention, preferably comprising from 2.5% to 15% by weight of xanthan gum.

The salt is generally used at a rate dependent upon the desired salt content of the meat, usually at a rate of 20 to 80 parts by weight, preferably 35 to 70 parts by weight, of salt per 1000 parts by weight of saturated brine.

The temperature of the suspension prior to injection will generally be about 2 to 3°C, the temperature of the meat being 5 to 6°C. The meat is usually stored at 3 to 4°C while being allowed to cure. Storage at higher temperatures can result in increased drip-loss.

The viscosity of the suspension is preferably in the range of 34CP to 120CP, corresponding generally to 0.30% to 0.45% of xanthan gum in the final brine; a viscosity range from 60CP to 85CP is especially preferred. Viscosities refer to values measured on a Brookfield Type LVT viscometer at 22°C. Such a viscosity does not give rise to difficulties in injection into the meat but holds in suspension the solid salt particles.

The present invention is especially advantageous as a method of curing meat, for example pork, in sealed plastic bags as it facilitates the production of high salt levels in the meat by injection and reduces drip-loss from the meat during storage.

The following Example illustrates the present invention.

EXAMPLE

The xanthan gum/salt mixtures according to the invention are illustrated by a mixture of microfine salt (10.2kg) and xanthan gum (0.3kg:Satiaxane CX 91 HV). The mixture contains 2.8% xanthan gum and 97.2% microfine salt:percentages are by weight.

A brine according to the invention for injection into meat may be prepared by adding the mixture described above, with stirring, to salt brine (89.5kg, 24°BE, corresponding to 24.5% salt). This yields 100.0kg of brine for injection (29°BE, corresponding to 32.3% salt). The brine thus produced has a viscosity of 34CP.

The quantity of xanthan gum in the brine described above may be altered with a corresponding change in the viscosity of the final brine:
0.35% xanthan gum gives a viscosity of 65.0CP; 0.45% xanthan gum leads to a viscosity of 120CP.

The foregoing viscosities were measured on a Brookfield Type LVT viscometer at 22°C.

CLAIMS

1. A method for curing meat with salt which comprises injecting into the meat saturated brine which comprises xanthan gum and which has suspended therein salt particles.

2. A method according to claim 1 in which the particle size is not greater than 100 micrometers.

3. A method according to claim 1 in which the particle size is not greater than 50 micrometers.

4. A method according to claim 1, 2 or 3 in which the brine comprises 0.2 to 0.45% by weight of xanthan gum.

5. A method according to any one of the preceding claims in which the salt is injected to provide a salt content from 2.75% to 4% by weight of the meat.

6. A process according to claim 5 in which the meat is injected with not more than 10% by weight of added water.

7. A process according to any one of claims 1 to 6 in which the salt suspension contains 20 to 80 parts by weight of solid salt per 1000 parts by weight of saturated brine.

8. A method according to claim 7 in which the salt suspension contains 35 to 70 parts by weight of solid salt.

9. A method according to any one of the preceding claims in which the brine also contains water soluble meat preservatives.

10. A method according to any one of the preceding claims in which the meat injected is pork.

11. A method according to any one of the preceding claims in which after injection the meat is kept in a sealed plastic bag until the salt has become substantially evenly distributed throughout the meat.

12. A method according to claim 1 substantially as hereinbefore described.

13. A solid composition comprising salt and xanthan gum.

14. A composition according to claim 13 in which the salt has a particle size not greater than 100 micrometers.

15. A composition according to claim 13 in which the salt has a particle size less than 50 micrometers.

16. A composition according to any one of claims 13 to 15 which comprises from 15 to 2.5% by weight of xanthan gum.

17. A composition according to claim 13 substantially as hereinbefore described.

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